EGS XXV General Assembly
Session PS1.01 / Location PS001

FIDO

Enabling Mars Rover Science Operations

Silver Lake, California April and October 1999 Field Tests

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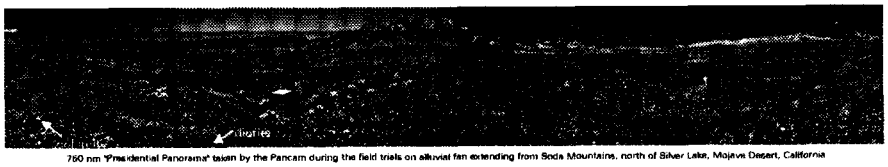
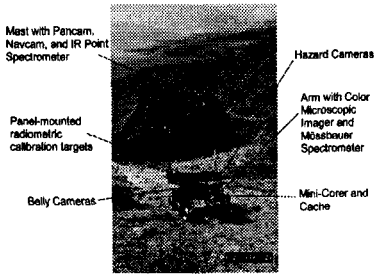


760 nm "Presidential Panorama" taken by the Pancam during the field trials on alluvial fan extending from Soda Mountains, north of Silver Lake, Mojave Desert, California

ROVER

- 110 cm x 97 cm x 53 cm and 62 kg
- 100 W, solar powered with replaceable batteries
- Rocker/bogie structure with 20 cm diameter wheels
- Commandable using Web Interface for Telescience

Washington University FIDO Science Server:
http://wundow.wustl.edu/rover
Jet Propulsion Laboratory Exploration Technology Rover Tasks site
http://robotics.jpl.nasa.gov/tasks/etrover



PAYLOAD

REMOTE SENSING (MAST)

PANCAM
- 15 cm stereobaseline, 0.35 mrad/pixel, false color infrared

NAVCAM
- 23 cm stereobaseline, 1.5 mrad/pixel, monochrome imager

INFRARED POINT SPECTROMETER
- Bore-sighted with Navcam
- 1.3-2.5 μm with 13 cm^{-1} spectral resolution and 16 bit encoding, and 9 Pancam-pixel spot size

ANALYTICAL CAPABILITIES (ARM)

COLOR MICROSCOPIC IMAGER
- Pixel size of 20 x 16 μm, FOV of ~1.5 cm

MÖSSBAUER SPECTROMETER
- Fe-57 MB Spectrometer for detection of iron-bearing minerals and iron oxidation states

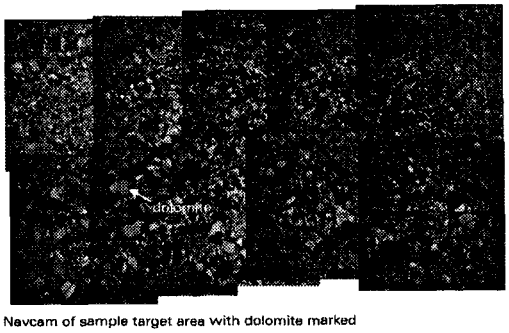
MINI-CORER DRILL AND BELLYCAMS
- Acquires 5mm by 1.7 cm rock drill cores
- Cores cached in sample container
- Monitored with Bellycams

PRIMARY MISSION - ACQUIRING AND CACHING SAMPLES

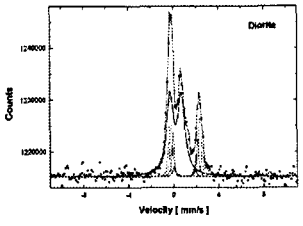
First 90 sols of Mars Sample Return Rover mission will be focused on finding, sampling, and caching rocks and soils

April field tests verified ability to remotely identify, traverse to, drill, and verify successful sample acquisition from dolomite and diorite targets

Bellycam image of Mini-Corer drilling into dolomite

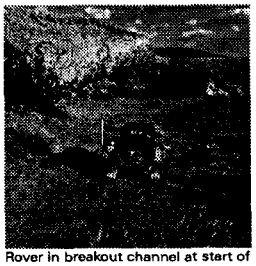


Navcam of sample target area with dolomite marked



Mössbauer spectrum of diorite, with fits associated with iron-bearing minerals pyroxene, olivine, ilmenite, hematite, and Ulvospinel (Fe_2TiO_4)

Map of Silver Lake area with sampling and traverse sites indicated

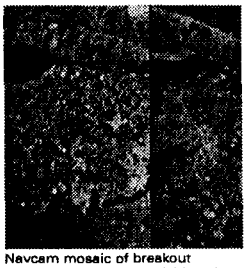


Rover in breakout channel at start of long-distance traverse

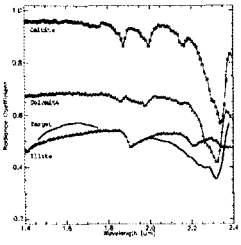
EXTENDED MISSION - EXPLORATION AND DISCOVERY

The extended Mars Sample Return Rover mission will be focused on exploration and discovery

April 1999 tests simulated exploration and discovery traverses in breakout channel focusing on acquisition of Pancam, Navcam, and IPS data



Navcam mosaic of breakout channel wall. IPS acquisition sites marked by black dots. Arrow marks spectrum shown on right



Spectrum acquired from target area. Comparison with lab spectra indicates dolomite-dominated rock

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